SCIENCE

NEW YORK, DECEMBER 11, 189[illegible].

HYGIENE AT ANN ARBOR.

In the memorial which asked for the establishment of a hygienic laboratory at the University of Michigan it was stated that one of the duties of those in charge of such an institution would consist in the examination, at a nominal fee to cover actual expenses, of articles of food and drink, on request of health officers throughout the State. This has already become a very important part of the work done at the laboratory, and a brief résumé of this work may not be without interest. The present notice will speak only of articles of food examined, omitting mention of the samples of water tested, although the latter have furnished the greater part of the work.

Four samples of meat supposed to have been taken from diseased animals have been examined. In only one of these did the microscopical examination bear out the supposition, and in this the presence of trichinæ was easily recognized. It is impossible from a study of the meat as it is sold in the market to detect many of the diseases to which our domestic animals are subject. The public can be protected from this source of disease only through an examination of the living animals by a competent veterinarian.

A can of currants, which was believed to have caused serious illness, with one fatal result, in Lapeer County, was carefully studied, both chemically and bacteriologically, with negative results. It was said by the neighbors of the family that the currant bushes had been freely sprinkled with a solution of Paris green before the ripening of the berries, and it was suspected that arsenic would be found in the fruit. This very improbable supposition was found to have no support. Unfortunately, none of the ejecta of the sick, and no part of the body of the man who died, were submitted to the chemist, and the cause of the sickness will probably never be known. Certainly, if they were cases of arsenical poisoning, the arsenic was taken with some other food or drink and not in the currants.

In some canned salmon which had produced alarming symptoms, there was found a germ which, when grown on ordinary media and with free exposure to the air, produces no poison. When thus grown, the germ itself, or its products, can be injected into animals without apparent effect, but when grown in a sterilized egg, the albumen of the egg becomes markedly poisonous, a few drops being sufficient to kill a white rat. It is highly probable that in the canning of the salmon, the contents of this can were not completely sterilized, and this germ, growing in the can, from which the air was excluded, elaborated the chemical poison to which the ill effects observed in the consumer were due.

Three new poisons have been found in decomposing milk. These belong to the proteid bodies and are albuminoses. They are due to the growth of germs which have been found in the intestines of children suffering from cholera infantum; and the characteristic symptoms of this disease, followed by death, may be induced in kittens by injecting a small amount of one of these poisons under the skin. The poisons differ from one another in some of their chemical and physical properties, but their toxicological effects seem to be practically identical. It is possible, however, that a closer study of their action may reveal differences which have not yet been detected.

A poisonous albuminose has been found in cheese also. It is probable that this may form in the cheese after its manufacture, and that it does not pre-exist in the milk from which the cheese is made. At least it is certain that one portion of a cheese may be poisonous, while another portion cut from the same cheese may be eaten with impunity.

A can of mince-meat which was believed to have poisoned a number of persons has furnished a perplexing but interesting study. That the meat is poisonous can be demonstrated by feeding it to cats and dogs, and cooking does not destroy its poisonous properties. However, the most careful and thorough study has failed to reveal the nature of the poison. Mineral and vegetable poisons are not present, and ptomaïnes and poisonous proteids have not been detected in the meat.

From the studies which have been carried on in the laboratory the following conclusions, concerning the manner in which meat and milk may become infected, have been drawn: —

(1) The infection may be due to the diseased condition of the animal from which these foods are obtained.

(2) The infection may be due to the inoculation of these foods with specific, pathogenic germs outside the body of the animal.

(3) Meat and milk, especially the latter, are often infected with suprophytic toxicogenic bacteria.

The transmission of tuberculosis from the cow to the child through milk, which is known in some instances to occur, is an example under the first head. The spread of typhoid fever through milk diluted with polluted water is an example of the infection with specific germs outside of the body; while all of those instances of poisoning from the eating of partially decomposed foods demonstrate the activity of those germs which, while not capable of inducing any specific disease, do elaborate most potent chemical poisons.

The number of poisons in decomposing food is probably large, the exact nature of the one found in a given case depending upon the character of the food, the nature of the infecting germ, the temperature and the stage of growth.

THE GREAT SALT DESERT OF PERSIA.[1]

The mountains of Siah Kuh rise to a height of about 5,000 feet above the level of the surrounding plains, which themselves constitute a plateau of about 3,000 feet to 4,000 feet above the sea-level. Looking towards the north, I could distinctly trace the course of the masonry causeway built by Shah Abbas to facilitate the communication with the south across this part of the desert, but the most remarkable feature of the landscape was that presented by the Darya-i-Namak,

[1] From a paper, by C. E. Biddulph, in Proceedings of the Royal Geographical Society, November.

the extent of which was fairly well distinguishable from this point of vantage, in spite of the glare which surrounded it.

For miles and miles away at our feet stretched what looked in the distance a vast frozen lake, but which was in fact a deposit of salt that entirely covered the low plains towards the south, and extended as far as the eye could reach towards the east and west, glittering in the sun like a sheet of glass. Towards the extreme west we imagined that this solid sheet was replaced by water, for we fancied we could see the ripples on its surface and the foam along the edge as the wind, which was high, drove it against the shore; but this may only have been owing to the heated air upon the surface, and the broken pieces of salt which were strewn along the margin. We sat for hours looking at this strange spectacle and examining it through our field-glasses, while our guides, who were some of the wild Ilyats, or wandering tribes which haunt this neighborhood, entertained us with all manner of strange stories regarding the peculiarities of its composition and the dangers to be encountered in traversing this vast deposit of salt.

According to their accounts, it was of the consistency of ice, and, like the latter, formed a coat of varying degrees of thickness upon the top of the water or swampy ground which lay underneath it. In some places they declared that this layer of salt attained a thickness of several feet, and that with such a degree of density that laden camels and mules could cross over it with perfect safety; while in other places where this was not the case, the crust of coagulated salt would break under their weight did they attempt it, and they would be engulfed in the waters or morass below beyond all hope of extrication. There appeared to be but one path, across which only those who were in the habit of traversing it, such as the owners of camels and mules, were well acquainted with, and which no one else in consequence attempted without a competent guide, for there was but little to mark its course, and if once lost sight of, the unfortunate traveller might wander for hours or days without finding it again, and probably end by dying of thirst if he succeeded in avoiding the more dangerous parts incapable of bearing his weight, where he would inevitably be swallowed up. They told us that the passage across this plain was quite impossible by day, at any rate if the sunshine were very bright, on account of the dazzling effect which its reflection upon the white surface of the salt produced, which was such as to quite prevent persons attempting it from seeing where they were going; and they recounted numerous instances of cases which had occurred of travellers who had disappeared from losing their way, and never been heard of again. Of course it seemed to us impossible to imagine how all this could be the case, for in a saturated solution of salt and water the salt would naturally be deposited upon the bottom, and not caked upon the surface; the guides, however, were so positive about the truth of what they said, and the appearance of the plain before our eyes seemed so peculiar, that our curiosity was thoroughly aroused, and we determined in consequence to completely change our intended route for the purpose of crossing the salt, especially as the moon being just at its full, every facility was offered for doing so. Our muleteers we found to make no objection, as they said that they were in the habit of crossing by this route, and that the surface of the salt was so hard and smooth, that it presented capital footing for the baggage animals. The following evening, accordingly, we found ourselves with our whole convoy of eight camels, sixteen mules, and three horses, approaching the margin of this salt plain, which was distant about fifteen miles from the foot of the mountain. As we neared this margin, the ground, which had been hitherto hard and dry, became damp and sloppy, so that we had to confine ourselves to moving along a distinct track, which had probably been used for centuries. To judge from the appearance of the ground here, a regular swamp must extend from the salt for some distance along its margin at certain seasons of the year, for on all sides were to be seen marks of animals who had strayed off the track, and got stuck in the clayey mud, from which it would seem in many cases, from the skeletons lying about, that they had been unable to extricate themselves.

After following this track, as it wound through this swampy ground for about a mile or so, we entered upon the sheet of salt itself, which, where the incrustation was thin, as was the case for some distance from its edge, was soft and sloppy, and mixed with earth resembling very much in its appearance the edge of the ice upon a frozen pool when a thaw has set in. As we proceeded, it gained more and more in consistency, till, at a distance of three or four miles from the edge, it looked like nothing more than a surface of very solid ice, such as might have been seen on any pond in England during the course of last winter. For this indeed, so far as its appearance went, it might easily have been mistaken, had it not been that, though the whole area over which it extended was perfectly level, the surface itself was not quite even, but resembled more that of ice which had partially thawed and then frozen again after a slight fall of snow; and, further, that instead of being continuous, it was broken up into countless polygonal blocks, whose dimensions varied from about six inches across to two or three feet or more. Of the solidity of this incrustation there could be no doubt, for there we were, camels, horses, and mules, travelling over it without a vibration of any kind being perceptible, or any sign of our weight making an impression on it. After marching for about eight or ten miles upon this strange surface, we halted to examine, as far as we could by the moonlight, its composition. We tried, by means of a hammer and an iron tent-peg, to break off a block of salt to take away with us as a specimen, but found it far too hard for us to make an impression upon, and though we succeeded in bending our tent-pegs almost double, we did not accomplish our wish; we managed, however, to chip off a lot of fragments, which we found here to be of the purest white; these were quite hard when we got them, but after keeping them a day or two they took up so much moisture from the air, that they got soft and friable and changed their color to a slatey hue.

We were assured by the muleteers and others that at this distance from the edge the salt deposit was as thick as eight or ten feet, and it seemed possible from our failure in the attempt to bore into it that this might not be any great exaggeration on their part; they stated also, as I have mentioned, that under this crust lay, if not standing water, at any rate a quagmire, and that if we had succeeded in our intention of breaking through the salt, the water from beneath would have burst through the opening thus made and flooded all the surrounding space; they further told us that in the winter, when the snow fell and melted on this surface, there was always water standing upon it, and that later on, as the snows on the surrounding higher ground thawed at the approach of spring, this increased to a depth of two or three feet; but that the mules could always cross so long as it did not get too deep for them to find footing, for that the layer of salt itself never lost any of its solidity, in spite of the water lying on it.

It is difficult to explain this phenomenon except upon the theory that this incrustation is the deposit accumulated upon these low plains in the course of centuries upon centuries, during which the annual melting of the snows upon the mountains and highlands, besides the rainfall and the perennial streams which drain into this basin, have brought down in the water from the strata of salt through which they pass these tremendous quantities of salt in solution. The summer sun has dried up the water by evaporation and left the salt deposit lying upon a soil more or less saturated with moisture, this layer of salt thus deposited has gained in thickness and consistency year by year until it has become a solid homogeneous mass too firmly bound together in the parts distant from the edge, where its thickness was most (owing to the greater depth of water which accumulated there, and consequent larger amount of salt deposited), to be broken by any pressure of water from below. The perennial streams have thus poured their waters underneath this strata. as the accumulation of water would naturally commence at the lowest part of the hollow, which would be about the middle of the salt plain, while the floods of water brought down by the rain and melting snow would overflow on to its surface from the margins. This is the only way by which it occurred to us that we could account for the dead level of the crust which, though covering a space of ground more or less hollow in its nature, as was evident from the run of the water all around, did not appear to us to slope in any direction, and also for the fact that on piercing through this crust water spouted out from below. Though we had no ocular demonstration of this fact, we were satisfied that it was the case from the accounts of a party of our servants whom we sent out the following day, when we had reached the further edge, to bring us a block of salt at a distance of a mile or two from the shore; another fact in support of this theory was that nearer the edge, where the crust was thinner and thus unable to resist the pressnre from below, it had evidently been burst by the rising of the water during the winter and spring, and lay tossed about in fragments.

After this halt we continued our march and arrived at the farther margin about 3 A.M.; it had thus taken us a good eight hours to cross this plain of salt, so that the distance traversed could not have been less than about twenty miles. As we expected, wo found that, as we approached the farther side, the crust of salt got thinner and thinner, till, on one occasion, getting slightly off the track, we quickly found the horses and mules sink through it almost up to the girths in a substance that resembled exactly melting snow, out of which we had to make the best of our way towards the harder material upon which we had been marching for so many hours. At length we hit off the beaten track which had been hardened by constant use during so many centuries, and were thankful indeed when we found ourselves again at last on *terra firma*.

NOTES AND NEWS.

AT the Franklin Institute, Philadelphia, on Friday evening, Dec. 11, a lecture was delivered by Mr. William L. Saunders, the well-known civil engineer of New York, on "The Compressed Air Power of the Future."

— During the summer the third and fourth stories of the south wing of University Hall, Ann Arbor, were fitted up as zoological and botanical laboratories. Each story affords about four thousand square feet of floor space. On each floor there are three principal rooms: a central room about forty-five feet square, a north room about twenty by forty feet, and a south room of the same size. There are also small rooms for the use of instructors. The fourth floor is devoted to botany, the central room being used as a general laboratory, the north room as a herbarium, and the south room as a research-laboratory for advanced students A small conservatory is to be constructed against one of the windows of the south room and will serve for experimental work. The other south window is occupied by an equarium. The third floor is devoted to zoology, the middle room being used as a general laboratory for beginners, and the north room for advanced work in vertebrate morphology. The south room has been divided into three compartments. One of these is lined with galvanized iron and serves to house the small animals required in the daily work of the laboratory. The second is used for alcoholic specimens, and the third is fitted up as a private laboratory for the professor in charge. In the zoological laboratories particular attention has been paid to the provision of means for keeping alive the animals that inhabit our inland waters. There are four large aquaria, and provision has been made for thirty-six smaller ones. There are also cages with running water for crayfish, frogs and other small animals that do not thrive well in ordinary aquaria. Each of these laboratories, the botanical and the zoological, can accommodate about fifty students. Contrary to expectation, they are now filled to nearly their full capacity, and by another year are likely to be crowded.

— Special Agent C. J. Murphy, charged with the introduction of Indian corn as a human food into Europe, has made a report to Secretary Rusk covering his work in Great Britain. In it he reviews the conditions which seem likely to encourage the use of this cereal food in Great Britain and other parts of Europe, and points out the various channels through which he has sought to introduce it, and the necessity for the co-operation of private individuals and commercial bodies in this country to take advantage of the work already done by the Government in this direction. Secretary Rusk has caused to be prepared for publication, in conjunction with Special Agent Murphy's report, a chapter upon the value of maize as food, by Dr. H. W. Wiley, chief chemist of the department, in which are shown the chemical composition of maize and its relative value for food purposes by comparison with other cereals. There is also a chapter, prepared by the assistant statistician, Mr. B. W. Snow, under the direction of the statistician, offering some additional observations as to the possibility of extending the use of this cereal among the people of Europe as a human food, and presenting a number of statistical tables showing the yield and value of our corn crop and the extent of our available resources in supplying home and foreign demand. The report is now in press and will be shortly ready for distribution.

— In a recent paper on the camel (*Zeits. für wissen. Geogr.*) Herr Lehmann refers, among other things, to its relations to temperature and moisture. Neither the most broiling heat, nor the most intense cold, nor extreme daily or yearly variations, according to an abstract in *Nature*, hinder the distribution of the camel. It seems, indeed, that the dromedary of the Sahara has better health there than in more equably warm regions; though, after a day of tropical heat, the thermometer sometimes goes down several degrees below freezing, and daily variations of 33.7° C. occur. In Semipalatinsk again, where the camel is found, the annual variation of temperature sometimes reaches 87.3°. In Eastern Asia, winter is the time the animals are made to work. In very intense cold, they are sewn up in felt covers. Of course each race of camel does best in the temperature conditions of its home: a Soudan camel would not flourish in North-east Asia. Camels are very sensitive to moisture. In the region of tropical rains they are usually absent, and if they come into such with caravans, the results of the rainy season are greatly feared. The great humidity of the air explains the absence of the camel from the northern slopes of the Atlas, and from well-wooded Abyssinia. This sensitiveness expresses itself in the character of different races. The finest, most noble-looking camels, with short silk-like hair, are found in the interior of deserts (as in the Tuarek region, in North Africa), and they cannot be used for journeys to moist regions. Even in Fezzan (south of Tripoli) the animals are shorter and fatter, with long coarse hair; and in Nile lands, and on